



Spectral Gamma-Ray Borehole
Log Data Report

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Borehole

41-07-05

Log Event A

Borehole Information

Farm : <u>SX</u>	Tank : <u>SX-107</u>	Site Number : <u>299-W23-76</u>
N-Coord : <u>35,308</u>	W-Coord : <u>75,639</u>	TOC Elevation : <u>663.54</u>
Water Level, ft :	Date Drilled : <u>2/28/1962</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>75</u>	

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency : <u>35.0 %</u>
Calibration Date : <u>03/1995</u>	Calibration Reference : <u>GJPO-HAN-1</u>	

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>6/5/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>54.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>6/5/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>75.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>59.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>6/5/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>52.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>Y</u>
Finish Depth, ft. : <u>54.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>4</u>	Log Run Date : <u>6/5/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>61.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>Y</u>
Finish Depth, ft. : <u>59.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>5</u>	Log Run Date : <u>6/6/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>45.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>Y</u>
Finish Depth, ft. : <u>52.0</u>	MSA Interval, ft. :	Log Speed, ft/min.: <u>n/a</u>

Borehole

41-07-05Log Event **A**

Log Run Number :	<u>6</u>	Log Run Date :	<u>6/6/1995</u>	Logging Engineer:	<u>Mike Widdop</u>
Start Depth, ft.:	<u>59.0</u>	Counting Time, sec.:	<u>100</u>	L/R :	<u>L</u> Shield : <u>Y</u>
Finish Depth, ft. :	<u>58.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst :	<u>S.E. Kos</u>	
Data Processing Reference :	<u>Data Analysis Manual Ver. 1</u>	Analysis Date : <u>10/3/1995</u>

Analysis Notes :

This borehole was logged in six log runs. Because of high count rate and resulting detector saturation, several log runs were necessary to bracket the high-count-rate zone and to log it with a shielded detector. Pre- and post- verification spectra indicate that the logging system was operating properly. The energy/channel drift observed during the logging runs exceed the search parameters of the processing software; therefore, several energy calibrations were required to process the data.

The casing thickness is 5/16 in. (0.3125 in.). The casing correction used to process the data was for 0.33-in.-thick casing; therefore, a slight over-estimation of radionuclide activity was calculated. The borehole was dry; no water correction was required. A shield correction was applied to the runs where the shield was installed over the detector.

The only man-made radionuclide identified was Cs-137. It was detected from ground surface to a depth of 12 ft, from 47.5 to 61 ft, from 66.5 to 75 ft (TD), and intermittently throughout the borehole. The maximum activity exceeded about 800 pCi/g, above which the detector became saturated.

The repeatability between the log runs with and without the shield at the upper and lower boundaries of the high-count-rate zone are in good agreement in the lower activity (less than 100 pCi/g) regions. However, in the high-count-rate regions (greater than 100 pCi/g) the repeatability deteriorates. Small differences in depth control between the logging runs, as well as high dead-time correction errors and shield corrections, may be causing the activity discrepancies.

Additional details regarding the interpretation of the data for this borehole are presented in the Tank Summary Data Report for tank SX-107.

Log Plot Notes:

Three log plots are provided. The Cs-137 activity is plotted on a separate plot to provide details of activity and distribution.

The natural gamma-ray logs show the activities of the naturally occurring radionuclides potassium (K-40), uranium (U-238), and thorium (Th-232). The KUT plot is provided to allow correlation of lithologic features between boreholes. The KUT activities observed in this borehole are typical for Hanford Site sediments.

A combination plot incorporates the Cs-137 and KUT log data with the total gamma-ray count rate derived from the spectral gamma-ray data and the gross gamma-ray data acquired with the WHC Tank Farm gross gamma-ray logging systems. This plot allows correlation of the Cs-137 contamination zones with lithologic features and

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with the gross gamma-ray historic record.

The statistical uncertainty in a measurement is represented on the log plots by uncertainty bars where appropriate. This uncertainty is reported at the 95-percent confidence interval. The minimum detectable activity (MDA) of a radionuclide represents the lowest activity at which positive identification of a gamma-ray peak is statistically defensible. The MDA values are indicated on the log plots by open circles. If the reported activity is slightly above the MDA, the 95-percent confidence interval may extend below the MDA value and the measurement cannot be stated with 95-percent confidence.

The Tank Farm gross gamma-ray plot is produced from the most recent data available from WHC. No corrections other than scale adjustments for plotting have been made to the data.